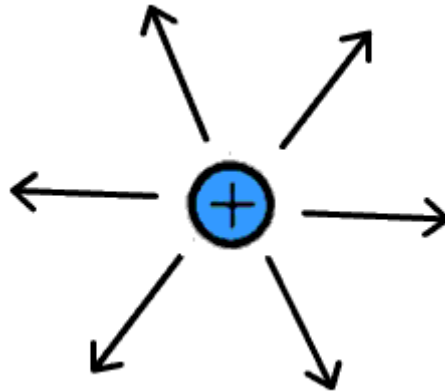


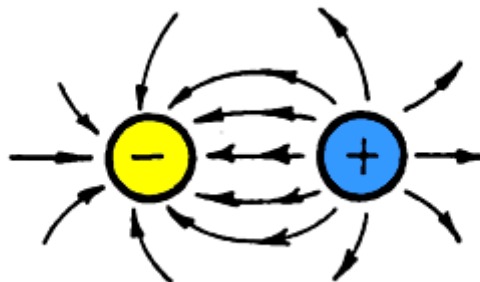
Charges

Electrical field

An electrical field surrounds every particle that has an electrical charge. By convention, the lines of the electric field are said to radiate from a (+) particle and move towards a (-) particle. It is not certain if there is any direction of radiation, and there is no real good explanation of what the electric field is made of. It's just there.



Electric field lines shown moving from a positive particle
When a positive charged particle (+) like a proton is near a negative charged particle (-) like an electron, the electrical field goes from one to the other.



Electrical field direction from (+) to (-)

Forces acting on charged particles

The electrical field acts like a force at a distance and the lines are considered lines of force.

Opposite charges attract

When a positive charged particle is near a negative charged particle, they are attracted to each other by the lines of force.

Static electricity

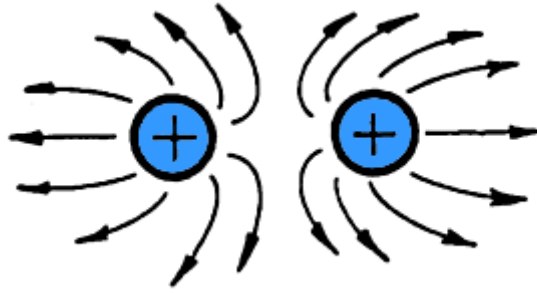
Static electricity is a good example of opposite charges attracting. If electrons are collected on the surface of one material and positive ions are collected on another surface, the negative and positive charges attract. Either the materials are pulled together or a stream of electrons jumps the gap as a spark.

Note that since protons are in the nucleus, they never collect on a surface in static electricity.

Rather, they contribute to the charge of the ions that have lost electrons.

Like charges repel

When particles have the same charge, they repel each other.



Like charges push away from each other

This can be seen in a static electricity experiment. Attach strings to two balloons and rub them both on a wool sweater. Then when you hang the balloons next to each other, you can see the electrical forces push them apart.